



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/565,172

01/19/2006

Rodney Alan Cross

3003-1115-1

7245

466

7590

04/27/2009

YOUNG & THOMPSON

209 Madison Street

Suite 500

ALEXANDRIA, VA 22314

EXAMINER

PICKARD, ALISON K

ART UNIT

PAPER NUMBER

3676

MAIL DATE

DELIVERY MODE

04/27/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/565,172	<b>Applicant(s)</b> CROSS ET AL.	
	<b>Examiner</b> Alison K. Pickard	<b>Art Unit</b> 3676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 51-74 and 76-78 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 51-74 and 76-78 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 51-74, and 76-78 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

3. Claims 51-74 and 76-78 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification does not appear to provide a written description (or enablement) of the gaps defined by the claims. Specifically, the specification does not appear to disclose a converging gap. And, it is unclear how a gap would exist on both sides of the plane passing through the line of contact. It appears that the rest of the tile on the side opposite the gap (e.g. shown in Fig. 3) would actually be in contact with the conical surface. If the tile makes a line contact through a mid-portion how are gaps achieved on either side of that plane? Does the tile bend? And, what are the "sides"? Right or left? Up or down? Please provide further

Art Unit: 3676

clarification on what is being claimed and how it is achieved. The claims have been examined as best understood.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 51-58, 60, 61, 63-72, 75 and 76-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura in view of Shapiro (5,399,024).

Kimura discloses an apparatus having a first portion 3 with a frusto-conical surface 31, a second portion 4 with a flat surface and a biasing device 10. The apparatus operates in a non-contact mode with gas between the faces, but the surfaces are in contact when the portions are at rest. The second portion includes an axially moveable tile carrier 5 with a tile element 4 defining the flat surface. The second sealing surface is located within a housing 6 having a ring (leg portion near line 2rb) on which the surface slides (forms the radial sealing surface). Kimura does not disclose plural pivotably mounted tiles. Shapiro teaches an apparatus having a first portion biased toward a second portion. Shapiro teaches using lift pads/tiles 60 having flat surfaces and biasing devices 48 that bias the pad about a spherical pivot point 80 and create a converging/diverging gap (e.g. see Fig. 5). The seal has low friction and allows for a bi-directional seal that counteracts closing loads. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the flat face of Kimura with the pad/tiles taught by Shapiro to improve the sealing function of the apparatus. This

Art Unit: 3676

configuration would provide the diverging gaps on either side of the closest point between the faces. Regarding claim 76, Kimura's prior art shows the faces without grooves.

Regarding claim 76, Shapiro teaches an angle is formed but does not appear to disclose the claimed range. However, it is not considered inventive to discover the optimum or workable ranges by routine experimentation absent some showing of criticality. See *In re Aller*, 105 USPQ 233, 235 (CCPA 1955).

Regarding claim 66, the examiner takes official notice that a wave spring is a known biasing device. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus by using a wave spring in place of coil spring 10 in Kimura.

6. Claim 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura in view of Shapiro and further in view of Gardner

Gardner teaches the use of additional seal on the opposite side of the rotor to create a bi-directional seal that functions regardless of shaft rotation direction. It would have been obvious to modify the first portion with an additional frusto-conical surface and mating ring as taught by Gardner to ensure a seal regardless of shaft rotation direction.

7. Claims 59, 73 and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura in view of Shapiro as applied to claims 51 and 69 and further in view of Gardner.

Kimura does not appear to disclose a coating on the surfaces. Gardner teaches using a coating to provide lubrication in dry gas environments. However, Gardner does not state the coating is abradable. The selection of a known material based on its suitability for its intended use is considered obvious. See *In re Leshin*, 125 USPQ 416 (CCPA 1960). Therefore, it would

Art Unit: 3676

have been obvious to one of ordinary skill in the art at the time the invention was made to use an abradable coating to provide lubrication in certain environments.

8. Claims 51-58, 60, 61, 63-65, 67-69, and 76-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singleton (3,529,838) in view of Shapiro.

Singleton discloses an apparatus with a first portion 20 having a frusto-conical surface 22 and a second portion 16 with at least one flat surface. Singleton does not disclose plural pivotably mounted tiles. Shapiro teaches an apparatus having a first portion biased toward a second portion. Shapiro teaches using lift pads/tiles 60 having flat surfaces and biasing devices 48 that bias the pad about a spherical pivot point 80 and create a converging/diverging gap (e.g. see Fig. 5). The seal has low friction and allows for a bi-directional seal that counteracts closing loads. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the flat face of Singleton with the pad/tiles taught by Shapiro to improve the sealing function of the apparatus. This configuration would provide the diverging gaps on either side of the closest point between the faces.

Regarding claim 76, Shapiro teaches an angle is formed but does not appear to disclose the claimed range. However, it is not considered inventive to discover the optimum or workable ranges by routine experimentation absent some showing of criticality. See *In re Aller*, 105 USPQ 233, 235 (CCPA 1955).

### ***Response to Arguments***

9. Applicant's arguments filed 1-26-09 have been fully considered but they are not persuasive.

Art Unit: 3676

As stated above, there is some confusion about what is meant by the gaps on either side of the line point of contact of the tile. However, it appears that modifying the flat rings of either Singleton or Kimura with the pivoting tile pads of Shapiro will result in the claimed structure. The pads will contact the tapered face of the other ring in a similar manner as Applicant's. And, Shapiro teaches the tiles pivot around a center and create a diverging gap.

### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alison K. Pickard whose telephone number is 571-272-7062. The examiner can normally be reached on M-F (9-5).

Art Unit: 3676

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer Gay can be reached on 571-272-7029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alison K. Pickard/  
Primary Examiner, Art Unit 3676

AP